SEQUENCE LISTING

<110> University of Guelph

<120> Novel Inducible Genes From Alfalfa And Method Of Use Thereof

<130> 08-892370WO

<140> n/a
<141> 2003-06-27

<150> 60/392,444
<151> 2002-06-28

<160> 19

<170> PatentIn version 3.1

<210> 1
<211> 474
<212> DNA
<213> Nucleotide sequence of H7 coding region

<400> 1
atgggtgttt ttactttcaa tgatgaacat gtctcaaccg tggctccagc taaactctac 60

aaggctcttg caaaagatgc tgatgaaatc gtcccaaagg tgatttctgc tgcccaaagt 120

gttgaaattg ttgaaggaaa tggaggaccc ggaactatta agaagctatc cattgttgaa 180

gatggcaaaa ccaactttgt gctacacaaa ttagattcag tggatgaggc aaactttgga 240

tataactaca gcttagtggg aggaacaggg ttggatgaaa gtttagagaa agttgaattt 300

gagacaaaaa ttgttgctgg ctctgatggt ggatccattg ttaagatttc agtgaaatac 360

cataccaaag gtgatgcaac tctatctgaa gcagtacgtg aggagactaa ggccaaagga 420

actggactta tcaaggccat tgagggctac gttttagcaa accctaatta ctag 474

<210> 2
<211> 678
<212> DNA
<213> Nucleotide sequence of H11 coding region

<400> 2
atggcctcca cactcagtct tgtcaagctt cccattcttt caagcatcaa gacacgccaa 60

tcaacctcaa aacatgttgt tccacttcca tccaaattca atattgtccc tcccacccca 120

ctaaagtttt cattagatca tcaaattaat atcaaacaaa cttctcttct atccctcaca 180

gcaatcacat ttccattctt attggatacc aaagagtttg ggatatttga aggaagaaca 240

tttgctctca ttcaccccat tgtgttgggt ggtttgttct tctatactct atatgctggc 300

tatttggggt ggcaatggcg ccgagttagg actattcaaa atgatattaa tgagctcaag 360

aaacaactca aacctgcacc ggtcgccccc gatggtaaag cacttgaaac ttcaccgcca 420

tcacctgttg aacttcaaat ccagaaactt actgaggaga ggaaagagct tatcaaaggt 480

tcatacaggg ataaacactt taatgctgga tccatacttc taggatttgg tgtctttgag 540

gctgttggtg tgaggactca acacatggtt aaggacagga aagctatttc caggtccaca 600

tttatttgca ggagcaggca ttaccgtctt atgggcactg gcagcagctc tagtaccacc 660

gatgcagaaa ggcagtga 678

<210> 3
<211> 744
<212> DNA
<213> Nucleotide sequence of H12 coding region

<400> 3
atggcaacca acgaagatca aaagcaaact gaatctggaa gacatcaaga agttggtcac 60

aagagtcttt tacaaagtga tgctctttac cagtatattc tagagaccag tgtcttccca 120

agagaacatg aagccatgaa agagttgaga gaggtcacag caaaacaccc atggaacatc 180

atgacaacct ctgcagatga aggacaattt ttgagcatgc tccttaaact tatcaatgct 240

aagaatacca tggaaattgg tgtctacact ggctactccc tccttgccac tgccctagct 300

attcctgaag atggaaagat tttggctatg gacattaaca aagaaaatta cgaattgggt 360

ctacctgtaa ttaaaaaagc tggtgttgat cacaaaattg atttcagaga aggtccagct 420

cttccagttc ttgatgaaat gatcaaagac gaaaagaatc atggtagcta cgatttcatt 480

tttgtggatg ctgacaaaga caattacctc aactaccata agaggttaat tgatcttgtt 540

aaagtgggag gtgtgatcgg gtacgacaac accttatgga atggatctgt ggttgcaccc 600

cctgatgctc cattgaggaa gtatgttagg tactatagag attttgtttt ggagcttaac 660

aaggctttgg ctgtggaccc taggattgaa atatgtatgc ttcctgttgg tgatggaatc 720

actatctgcc gtaggatcaa gtaa 744

<210> 4
<211> 634
<212> DNA
<213> Nucleotide sequence of H7 regulatory region

<400> 4
acgcgtggtc gacggcccgg gctggtacta aagtattact attaccaaat ttttaggacc 60

ccacccatga caccattgct atatttcaat ttgggaaaat attgctataa agttactgta 120

gtaactttta gaagaaggtt tttttttaa ggattttaga ggaaggttag caacacacat 180

gcactttaaa tatacatttt ttcttataaa gtttttgtat cgagttgaga aatcatatat 240

atactcataa atcatgtgga tttcatataa tttaatagaa cacataaatt ttaaccgaga 300

aataaagtgt tgcaaatata tgttaaaaga gtacgttgtt aacattattt taatttcttt 360

tattcaatcc acactttgag tcatggactg ctatactaat tcattttgtt tttcgcaacc 420

taattagaga ttgtccagat acaaagagga gtaacctaat aaataaatat taaaatattc 480

accaacggcc tcagtaagct acttgagcta aacaatgaga tttccaaata aggtaggtcc 540

ttcccaagtt ctataaatag catccctcac catgtcataa accgcatcac aagttatata 600

ctgtattcat actatacact tatcctttca ttta 634

<210> 5
<211> 438
<212> DNA
<213> Nucleotide sequence of H11 regulatory region

<220>
<221> misc_feature
<222> (1)..(438)
<223> where "n" is a or g or c or t or other

<400> 5
cagaaccccg anaggctggt gctagtatgg cttcgttgta atacgactca ctatagggcg 60

cgcgtggtcg acggcccggg ctggtatcag cgagtaacga ttcatcatat ctcacactag 120

ggatgaatga tttattattg agtttatgaa tttgaactat tacttctaat ttctaaatga 180

agacatttaa gtaaaagatt aaaatattct agtttcaaat attttggatt ttagaattta 240

aatttaatct ttaaaaaaaa attaaattta aagaagataa aaagggagaa aataaataga 300

tgaatataat ttgtaaacat gaagacctta tctccagtaa aaaaacatat ggaccttatc 360

tttttgaggt aggaaggatc tacgcgggga acctcttcct gactgtgaac cccgtatgca 420

gaggcagaga cagagagt 438

<210> 6
<211> 936
<212> DNA
<213> Nucleotide sequence of H12 regulatory region

<400> 6
aaatacaaag gtgaccttat tttgcaaata atccatgcat ggaaatgcat catccttttg 60

aaaatgggtt tatctgaatt cttaagttac gtgaaaattt aatacatttc attttagata 120

aatttattat taaaattcac acttagatgg cctaaaaatt aacacttatt tttaacaatt 180

caaataaaat atacgacgaa atgagtgtaa tttagttggt taagcatcgt caaagcttgg 240

agagaaagat catagtttga tctttgaaaa ctatactatt gaaaagggtg aagatatcta 300

acctccaaca aaatttattt gatagtcgat tcaaattatc aaaatttgga aaatattttg 360

taaattgtta agttgggaaa aatatgttaa ttttcaaatt accatttgca cattttttcta 420

atctcaaatc acatttaagg gatgttgact actttcgttt tgtacaaatc tttacaattt 480

taacatttat aaaatgtgtt ttggtagata aaaagtgtga gtattcttta taagagattg 540

tgtttttctt ttgttttaac ttataaaata aatatatatt ttattttatt ttaacgtgag 600

attgtaagaa ttcattataa gattatgtca ttccctcaaa agaaaattag atgatgtcat 660

tttcataact cattttctat aaatacagaa aatcctcaaa aatgaaaaac ctcggtcaaa 720

aaataaaaga aaaacatcaa tagtggactg gcccacactc attgctttgc tttagtatga 780

gaaagtagac ctcaccaacc acgaaccgga cgccgaccgg ttcaaccaaa catcacacca 840

attttcctaa accataccgg tttttccctc ccttatataa ccatcctctc ccctcttctc 900

taaccaagct tcattcaact cttcaacaca tatcag 936

<210> 7
<211> 1424
<212> DNA
<213> Nucleotide sequence of genomic H7

<400> 7
acgcgtggtc gacggcccgg gctggtacta aagtattact attaccaaat ttttaggacc 60

ccacccatga caccattgct atatttcaat ttgggaaaat attgctataa agttactgta 120

gtaactttta gaagaaggtt tttttttaa ggattttaga ggaaggttag caacacacat 180

gcactttaaa tatacatttt ttcttataaa gtttttgtat cgagttgaga aatcatatat 240

atactcataa atcatgtgga tttcatataa tttaatagaa cacataaatt ttaaccgaga 300

aataaagtgt tgcaaatata tgttaaaaga gtacgttgtt aacattattt taatttcttt 360

tattcaatcc acactttgag tcatggactg ctatactaat tcattttgtt tttcgcaacc 420

taattagaga ttgtccagat acaaagagga gtaacctaat aaataaatat taaaatattc 480

accaacggcc tcagtaagct acttgagcta aacaatgaga tttccaaata aggtaggtcc 540

ttcccaagtt ctataaatag catccctcac catgtcataa accgcatcac aagttatata 600

ctgtattcat actatacact tatcctttca tttacttctt gcatattgat ccttgttatc 660

ttgatatata tatcatgggt gtttttactt tcaatgatga acatgtctca accgtggctc 720

cagctaaact ctacaaggct cttgcaaaag atgctgatga aatcgtccca aaggtgattt 780

ctgctgccca aagtgttgaa attgttgaag gaaatggagg acccggaact attaagaagc 840

tatccattgt tgaagatggc aaaaccaact ttgtgctaca caaattagat tcagtggatg 900

aggcaaactt tggatataac tacagcttag tgggaggaac agggttggat gaaagtttag 960

agaaagttga atttgagaca aaaattgttg ctggctctga tggtggatcc attgttaaga 1020

tttcagtgaa ataccatacc aaaggtgatg caactctatc tgaagcagta cgtgaggaga 1080

ctaaggccaa aggaactgga cttatcaagg ccattgaggg ctacgtttta gcaaacccta 1140

attactagcc aattaaaccc tattgaggac tttaatttgg gttgtgttgt ttcatgcgaa 1200

taataattaa agtttatgat gcggttgaag tgtgttgagt atacatcaag gtctttggct 1260

cgtacatgtg tgttggcttt gttggatgtt gtgaggtttg agtgctattt tgggtgttta 1320

aaaacaaaaa cctatgttgt gttggtgata aggttttgca ccatctgtat tatgcaataa 1380

ataatgcaaa agaattttat cgcgaaaaaa aaaaaaaaaa aaaa 1424

<210> 8
<211> 1482
<212> DNA
<213> Nucleotide sequence of genomic H11

<220>
<221> misc_feature
<222> (1)..(1482)
<223> Where n is a or g or c or t or other

<400> 8
cagaaccccg anaggctggt gctagtatgg cttcgttgta atacgactca ctatagggcg 60

cgcgtggtcg acggcccggg ctggtatcag cgagtaacga ttcatcatat ctcacactag 120

ggatgaatga tttattattg agtttatgaa tttgaactat tacttctaat ttctaaatga 180

agacatttaa gtaaaagatt aaaatattct agtttcaaat attttggatt ttagaattta 240

aatttaatct ttaaaaaaaa attaaattta aagaagataa aaagggagaa aataaataga 300

tgaatataat ttgtaaacat gaagacctta tctccagtaa aaaaacatat ggaccttatc 360

tttttgaggt aggaaggatc tacgcgggga acctcttcct gactgtgaac cccgtatgca 420

gaggcagaga cagagagtat ggcctccaca ctcagtcttg tcaagcttcc cattctttca 480

agcatcaaga cacgccaatc aacctcaaaa catgttgttc cacttccatc caaattcaat 540

attgtccctc ccaccccact aaagttttca ttagatcatc aaattaatat caaacaaact 600

tctcttctat ccctcacagc aatcacattt ccattcttat tggataccaa ggcaagcaag 660

caagcaagca tcctattcta ttctattctt tcatccatat ctttactctt ttgttttcta 720

accaatccat gatatgaatg ttgttgaaac aggatgcact tgctgttggt ggagagtttg 780

ggatatttga aggaagaaca tttgctctca ttcaccccat tgtgttgggt ggtttgttct 840

tctatactct atatgctggc tatttggggt ggcaatggcg ccgagttagg actattcaaa 900

atgatattaa tgagctcaag aaacaactca aacctgcacc ggtcgccccct gatggtaaag 960

cacttgaaac ttcaccgcca tcacctgttg aacttcaaat ccagaaactt actgaggaga 1020

ggaaagagct tatcaaaggt tcatacaggg ataaacactt taatgctgga tccatacttc 1080

taggatttgg tgtctttgag gctgttggtg tgaggactca acacatggtt aaggacagga 1140

aagctatttc caggtccaca tttatttgca ggagcaggca ttaccgtctt atgggcactg 1200

gcagcagctc tagtaccacc gatgcagaaa ggcagtgaaa cagccagaaa tcttcacatt 1260

gctctgaata cattgaatgt tcttctcttt gtgtggcaga ttcccactgg acttgatatt 1320

gtatggaaag tgtttgagtt cacaaaatgg ccttgaatgt atgattctca tatgtaagta 1380

agttcccagg tattttactt tcaaatcagt atttggcaat atcaataaat gcaaaatttg 1440

ctattctgca ttttcaaaaa aaaaaaaaaa aaaaaaaaaa aa 1482

<210> 9
<211> 1906
<212> DNA
<213> Nucleotide sequence of genomic H12

<400> 9
aaatacaaag gtgaccttat tttgcaaata atccatgcat ggaaatgcat catccttttg 60

aaaatgggtt tatctgaatt cttaagttac gtgaaaattt aatacatttc attttagata 120

aatttattat taaaattcac acttagatgg cctaaaaatt aacacttatt tttaacaatt 180

caaataaaat atacgacgaa atgagtgtaa tttagttggt taagcatcgt caaagcttgg 240

agagaaagat catagtttga tctttgaaaa ctatactatt gaaaagggtg aagatatcta 300

acctccaaca aaatttattt gatagtcgat tcaaattatc aaaatttgga aaatattttg 360

taaattgtta agttgggaaa aatatgttaa ttttcaaatt accatttgca catttttcta 420

atctcaaatc acatttaagg gatgttgact actttcgttt tgtacaaatc tttacaattt 480

taacatttat aaaatgtgtt ttggtagata aaaagtgtga gtattcttta taagagattg 540

tgtttttctt ttgttttaac ttataaaata aatatatatt ttattttatt ttaacgtgag 600

attgtaagaa ttcattataa gattatgtca ttccctcaaa agaaaattag atgatgtcat 660

tttcataact cattttctat aaatacagaa aatcctcaaa aatgaaaaac ctcggtcaaa 720

aaataaaaga aaaacatcaa tagtggactg gcccacactc attgctttgc tttagtatga 780

gaaagtagac ctcaccaacc acgaaccgga cgccgaccgg ttcaaccaaa catcacacca 840

attttcctaa accataccgg tttttccctc ccttatataa ccatcctctc ccctcttctc 900

taaccaagct tcattcaact cttcaacaca tatcagaaac agaaaaaaga agcaaaacat 960

tccaagaatt taacaatggc aaccaacgaa gatcaaaagc aaactgaatc tggaagacat 1020

caagaagttg gtcacaagag tcttttacaa agtgatgctc tttaccagta tattctagag 1080

accagtgtct tcccaagaga acatgaagcc atgaaagagt tgagagaggt cacagcaaaa 1140

cacccatgga acatcatgac aacctctgca gatgaaggac aatttttgag catgctcctt 1200

aaacttatca atgctaagaa taccatggaa attggtgtct acactggcta ctccctcctt 1260

gccactgccc tagctattcc tgaagatgga aagattttgg ctatggacat taacaaagaa 1320

aattacgaat tgggtctacc tgtaattaaa aaagctggtg ttgatcacaa aattgatttc 1380

agagaaggtc cagctcttcc agttcttgat gaaatgatca aagacgaaaa gaatcatggt 1440

agctacgatt tcatttttgt ggatgctgac aaagacaatt acctcaacta ccataagagg 1500

ttaattgatc ttgttaaagt gggaggtgtg atcgggtacg acaacacctt atggaatgga 1560

tctgtggttg caccccctga tgctccattg aggaagtatg ttaggtacta tagagatttt 1620

gttttggagc ttaacaaggc tttggctgtg gaccctagga ttgaaatatg tatgcttcct 1680

gttggtgatg gaatcactat ctgccgtagg atcaagtaat tggtttgcat gtgcactata 1740

tcatgtaatg cactgctcca cattattgat cattattgtg tggaagctac agagcattta 1800

aaagtcttca agccttcttg tcttttgtta tttttcttca acatatttgt ggttgtaatt 1860

ttctcttgtc attgatattg aaacttcgaa taattgaaag ttatat 1906

<210> 10
<211> 157
<212> PRT
<213> Amino acid sequence encoded by H7 coding region

<400> 10

Met Gly Val Phe Thr Phe Asn Asp Glu His Val Ser Thr Val Ala Pro
1 5 10 15

Ala Lys Leu Tyr Lys Ala Leu Ala Lys Asp Ala Asp Glu Ile Val Pro
20 25 30

Lys Val Ile Ser Ala Ala Gln Ser Val Glu Ile Val Glu Gly Asn Gly
35 40 45

Gly Pro Gly Thr Ile Lys Lys Leu Ser Ile Val Glu Asp Gly Lys Thr
50 55 60

Asn Phe Val Leu His Lys Leu Asp Ser Val Asp Glu Ala Asn Phe Gly
65 70 75 80

Tyr Asn Tyr Ser Leu Val Gly Gly Thr Gly Leu Asp Glu Ser Leu Glu
85 90 95

Lys Val Glu Phe Glu Thr Lys Ile Val Ala Gly Ser Asp Gly Gly Ser
100 105 110

Ile Val Lys Ile Ser Val Lys Tyr His Thr Lys Gly Asp Ala Thr Leu
115 120 125

Ser Glu Ala Val Arg Glu Glu Thr Lys Ala Lys Gly Thr Gly Leu Ile
130 135 140

Lys Ala Ile Glu Gly Tyr Val Leu Ala Asn Pro Asn Tyr
145 150 155

<210> 11
<211> 247
<212> PRT
<213> Amino acid sequence encoded by H12 coding region

<400> 11

Met Ala Thr Asn Glu Asp Gln Lys Gln Thr Glu Ser Gly Arg His Gln
1 5 10 15

Glu Val Gly His Lys Ser Leu Leu Gln Ser Asp Ala Leu Tyr Gln Tyr
20 25 30

Ile Leu Glu Thr Ser Val Phe Pro Arg Glu His Glu Ala Met Lys Glu
35 40 45

Leu Arg Glu Val Thr Ala Lys His Pro Trp Asn Ile Met Thr Thr Ser
50 55 60

Ala Asp Glu Gly Gln Phe Leu Ser Met Leu Leu Lys Leu Ile Asn Ala
65 70 75 80

Lys Asn Thr Met Glu Ile Gly Val Tyr Thr Gly Tyr Ser Leu Leu Ala
85 90 95

Thr Ala Leu Ala Ile Pro Glu Asp Gly Lys Ile Leu Ala Met Asp Ile
100 105 110

Asn Lys Glu Asn Tyr Glu Leu Gly Leu Pro Val Ile Lys Lys Ala Gly
115 120 125

Val Asp His Lys Ile Asp Phe Arg Glu Gly Pro Ala Leu Pro Val Leu
130 135 140

Asp Glu Met Ile Lys Asp Glu Lys Asn His Gly Ser Tyr Asp Phe Ile
145 150 155 160

Phe Val Asp Ala Asp Lys Asp Asn Tyr Leu Asn Tyr His Lys Arg Leu
165 170 175

Ile Asp Leu Val Lys Val Gly Gly Val Ile Gly Tyr Asp Asn Thr Leu
180 185 190

Trp Asn Gly Ser Val Val Ala Pro Pro Asp Ala Pro Leu Arg Lys Tyr
195 200 205

Val Arg Tyr Tyr Arg Asp Phe Val Leu Glu Leu Asn Lys Ala Leu Ala
210 215 220

Val Asp Pro Arg Ile Glu Ile Cys Met Leu Pro Val Gly Asp Gly Ile
225 230 235 240

Thr Ile Cys Arg Arg Ile Lys
245

<210> 12
<211> 44
<212> DNA
<213> Nucleotide sequence of PCR-Select cDNA synthesis primer

<220>
<221> misc_feature
<222> (1)..(44)
<223> where n is a or g or c or t or other

<400> 12
ttttgtacaa gctttttttt tttttttttt tttttttttt ttnn 44

<210> 13
<211> 44
<212> DNA
<213> Nucleotide sequence of Adaptor 1

<400> 13
ctaatacgac tcactatagg gctcgagcgg ccgcccgggc aggt 44

<210> 14
<211> 42
<212> DNA
<213> Nucleotide sequence of Adaptor 2R

<400> 14
ctaatacgac tcactatagg gcagcgtggt cgcggccgag gt 42

<210> 15
<211> 22
<212> DNA
<213> Nucleotide sequence of PCR primer 1

<400> 15
ctaatacgac tcactatagg gc 22

<210> 16
<211> 19
<212> DNA
<213> Nucleotdie sequence of nested PCR primer 1

<400> 16
tcgagcggcc gcccgggca 19

<210> 17
<211> 20

<212> DNA
<213> Nucleotdie sequence of nested PCR primer 2R

<400> 17
agcgtggtcg cggccgaggt 20

<210> 18
<211> 10
<212> DNA
<213> Nucleotide sequence of complement (partial)

<400> 18
ggcccgtcca 10

<210> 19
<211> 10
<212> DNA
<213> Nucleotide sequence of complement (partial)

<400> 19
gccggctcca 10